APPENDIX F. BIOLOGICAL EVALUATION

1. Project Name: State Route 179 (Village of Oak Creek to Sedona)

2. Project Location: Village of Oak Creek to Sedona, Yavapai and Coconino Counties
Milepost 304.5 to Milepost 313.4

3. Species Being Evaluated:
(Species excluded from evaluation - justification for their exclusion is listed in the Appendix.)

Species	Common Name	Species Status[1]
Mammals		
Lutra canadensis sonora	Southwestern River Otter	FS
Birds		
Falco peregrinus anatum	American Peregrine Falcon	FS
Haliaeetus leucocephalus	Bald Eagle	F-T
Buteogallus anthracinus	Common Blackhawk	FS
Empidonax traillii extimus	Southwestern Willow Flycatcher	F-E
Coccyzus americanus occidentalis	Western Yellow-billed Cuckoo	F-C
Fish		
Ptychocheilus lucius	Colorado Pikeminnow	F-E
Gila intermedia	Gila Chub	F-C
Lepidomeda vittata	Little Colorado Spinedace	F-T
Tiaroga cobitis	Loach Minnow	F-T, FS
Gila robusta	Roundtail Chub	FS
Xyrauchen texanus	Razorback Sucker	F-E, FS
Meda fulgida	Spikedace	F-T, FS
Amphibians and Reptiles		
Bufo microscaphus microscaphus	Arizona Toad	FS
Xantusia vigilis arizonae	Arizona Night Lizard	FS
Rana yavapaiensis	Lowland Leopard Frog	FS
Thamnophis eques	Mexican Garter Snake	FS

Thamnophis rufipunctatus	Narrow-headed Garter Snake	FS
Invertebrates		
Cicindela hirticollis corpuscular	Tiger Beetle	FS
Cicindela oregona maricopa	Maricopa Tiger Beetle	FS
Agathymus aryxna	Aryxna Giant Skipper	FS
Callophrys comstocki	Comstock's Hairstreak	FS
Agathymus baueri freemani	Freeman's Agave Borer	FS
Agathymus neumoegeni	Neumogen's Giant Skipper	FS
Limenitis archippus obsoleta	Obsolete Viceroy Butterfly	FS
Piruna polingii	Spotted Skipperling	FS
Plants		
Agave arizonica	Arizona Agave	F-E
Pediocactus paradinei	Kaibab Plains Cactus	F-C
Agave delamateri	Tonto Basin Agave	FS

[1] Status Definitions

F-E - Federal Endangered
F-T - Federal Threatened
FS - Forest Service Sensitive
F-C - Federal Candidate

4. Critical Habitat in Project Area:

Critical habitat does not occur within the project area limits, although critical habitat designated for the Spikedace and Loach Minnow does occur within the 100-year floodplain of Oak Creek at a location approximately 800 feet west of the existing State Route (SR) 179 roadway at milepost (MP) 311.2 (Figure 1).

5. Purpose and Need:

Traffic volumes along the SR 179 corridor are expected to increase between 36% and 93% over the next 25 years. The Arizona Department of Transportation (ADOT) has undertaken this project to increase the capacity and improve traffic operations of this route.

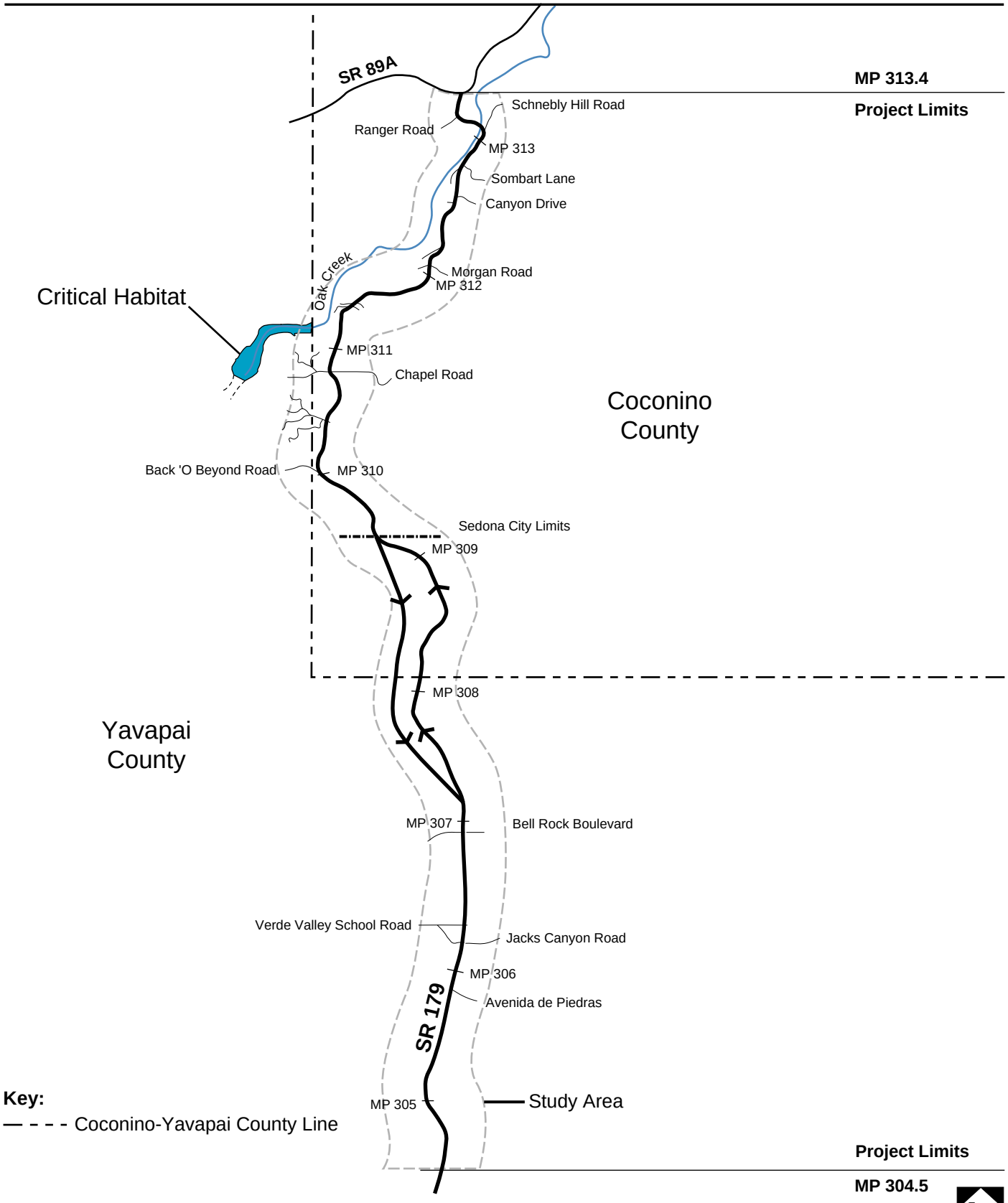

Figure 1. Loach Minnow and Spikedace Critical Habitat

6. Proposed Action:

ADOT has determined that the ultimate facility should provide four through lanes for the entire segment of SR 179 to meet the future transportation needs of the public. The proposed action is comprised of the following typical roadway sections:

- A four-lane roadway with a raised median and outside shoulders from MP 304.5 to MP 305.9 (south of the Sedona Golf Resort entrance);
- A four-lane curbed roadway with a raised median from MP 305.9 to MP 307.1 (north of Bell Rock Boulevard);
- A four-lane roadway with a raised median and outside shoulders from MP 307.1 to MP 307.2 (0.3 kilometer/0.2 mile north of Bell Rock Boulevard);
- A four-lane rural divided roadway with bifurcated (independent) alignments and outside shoulders from MP 307.2 to MP 309.6 (0.8 kilometer/0.5 mile south of Back 'O Beyond Road);
- A four-lane roadway with a raised median and outside shoulders from MP 309.6 to MP 309.9 (0.3 kilometer/0.2 mile south of Back 'O Beyond Road);
- A four-lane curbed roadway with a raised median from MP 309.9 to MP 310.1 (at Back 'O Beyond Road); and
- A five-lane curbed roadway with intermittent sections of a 2.4-meter (8–foot) wide curbed median from MP 310.1 to MP 313.4 (SR 89A).

Curbed sections of roadway incorporate gutters along the roadway, while rural sections have 8-foot outside shoulders. A five-lane roadway consists of two travel lanes of traffic in each direction with a center left turn lane. Bifurcation refers to the independent vertical and horizontal alignment of the directional travel lanes. The northbound and southbound lanes will be separated for approximately 2.5 miles. One new bridge structure will be built over an unnamed drainage along the bifurcated section near MP 309.0. The existing bridge at Oak Creek, located near MP 303.1, will be reconstructed and widened. During bridge reconstruction, equipment will be restricted to paved portions of the roadway. In addition, nine scenic pullouts will ultimately be constructed to provide safe locations for motorists to exit the highway to view and photograph the scenery along this portion of SR 179. A total of approximately 120 acres of new right-of-way (ROW) will be required for the proposed improvements.

The proposed improvements will require the acquisition of approximately 110 acres of National Forest land that is currently used for non-transportation public uses. Of this total, approximately 53 acres will be required for the proposed bifurcated portion of the highway and 57 acres for the proposed scenic pullouts. Approximately 62 acres will be initially disturbed by construction activities, but will be revegetated. The remaining 48 acres will be permanently disturbed by the new roadway segments and scenic pullouts. In addition, the proposed improvements will require the acquisition of approximately 10 acres of private land, of which a portion includes the reconstruction of the Oak Creek Bridge.

A portion of the riparian habitat associated with Jacks Canyon, Margs Draw, and Oak Creek will also be affected. Jacks Canyon is essentially an ephemeral (dry) wash that parallels a portion of SR 179

between MP 304.5 and MP 305.5. Oak Creek is perennial from its headwaters to its confluence with the Verde River. Important riparian habitats are present along Oak Creek's entire corridor. A total of approximately 0.9 acre of riparian habitat will be permanently disturbed and 0.8 acre will be temporarily disturbed within the study limits.

Oak Creek has been designated as a "Unique Water" by the Water Quality Control Council of the Arizona Department of Environmental Quality (ADEQ) because of its recreational and ecological significance. Stringent water-quality standards protect Oak Creek from degradation. The contractor shall be required to adhere to ADEQ's water-quality standards and mitigation measures as identified in the SR 179 (Village of Oak Creek to Sedona) Environmental Assessment. These measures will minimize disturbances to the aquatic life and water quality of Oak Creek. In addition, equipment used for bridge reconstruction will primarily be operated from previously disturbed areas along the existing SR 179.

7. Data Sources

The majority of the proposed roadway improvements will occur within the existing transportation corridor. No formalized surveys or monitoring were conducted within the project area. However, there was an informal survey conducted on August 20, 2001, for the occurrence of the Tonto Basin Agave, from the Oak Creek Bridge at MP 313.4 south within the SR 179 ROW to approximately MP 312.6. No Tonto Basin Agave was found within the project limits. In addition, the portion of the roadway that will be separated from the existing highway was walked in June 1995 by Janie Agyagos, Sedona Ranger District, and Lee Leudeker, Arizona Game and Fish (AGFD), to determine habitat conditions for sensitive species. Information on habitat requirements and occurrences of specific species were evaluated using the Sedona Ranger District atlas and files/information provided by Forest Service and AGFD biologists.

8. Affected Habitat

Vegetation types within the study area include pinyon pine/juniper woodland, interior chaparral, and deciduous riparian forests. Typical species of the pinyon pine/juniper woodland include the pinyon pine, one-seed juniper, and Utah juniper. Characteristic chaparral shrub species are tough-leaved evergreens such as scrub oak, manzanita, sugar sumac, mountain mahogany, and wait-a-minute bush. Riparian forests include such species as cottonwood, willow, ash, and sycamore, which are broadleaf, deciduous trees. Arizona cypress occurs along several of the ephemeral drainages within the study area, including Jacks Canyon. Typical grass species include western wheatgrass, blue grama, squirreltail, and Indian ricegrass. Prickly pear, cholla, and hedgehog represent the commonly found cacti within the study area.

9. Effects of the Proposed Action

Southwestern River Otter. Southwestern River Otters have been found in the upper Verde River, Oak Creek, Beaver Creek, throughout the extent of the Colorado River, the lower portion of the Lower Colorado River, a portion of the Salt River near the confluence of Cherry Creek, and near Chevelon Canyon. In addition, there were 20 River Otters released by the AGFD along the Verde River between Camp Verde and Horseshoe Dam in 1981. This species is found mainly along rivers, which they use to hunt for food, take refuge from danger, and travel. Otters require permanently flowing water or ponds, overhanging bank vegetation, and haul-out sites suitable for leaving and entering the water. These

habitats are found in a variety of plant associations, ranging from semidesert shrubland to subalpine forest. Southwestern River Otters require relatively high-quality water with low sediment loads and an abundant food base of fish or crustaceans. Minimum estimated water flows are 10 cubic feet per second. River Otters do not build their own dens, but utilize natural cavities such as rock piles, dense vegetation, and abandoned dens of other animals, which can be up to a half mile away from the water. The vegetation that these otters are associated with is variable, but important features of these plants include shading the nearby waters and protecting the soil from erosion, as well as being the primary producers within wetland systems. This species feeds on fish, frogs, turtles, crayfish, or other animals frequenting streams.

The decline of this species has been caused by channelization, bank-armoring, marshland draining, human encroachment, and other types of habitat destruction, as well as over-harvesting. Suitable habitat exists in Oak Creek within the project area, and river otters are resident in Oak Creek. However, riparian vegetation loss at Oak Creek will be minimal, and because of the mitigation measures that will be implemented (see Loach Minnow), water quality will be minimally impacted. Therefore, the proposed project may impact individuals, but is not likely to result in trend toward federal listing or loss of viability.

American Peregrine Falcon. American Peregrine Falcons occur statewide in Arizona as migrant, transient, or wintering individuals. Suitable habitat consists of rock cliffs for nesting with a mean height of 200 to 300 feet and large foraging areas. Peregrines prey mainly on birds found in wetlands, riparian areas, meadows, parklands, croplands, mountain valleys, and lakes within a 10- to 20-mile radius from the nest site. Other prey items include bats and other mammals. Peregrines are very sensitive to disturbance during the breeding season, which occurs from March 1 to August 31.

A known Peregrine Falcon nesting site (eyrie) is located approximately 7.5 miles north of the project area near Schnebly Hill Road, and Peregrines are suspected to nest at Cathedral Rock and Gibralter Rock, located 0.8 and 0.9 mile from SR 179 respectively. Although no eyrie has been located at either Cathedral Rock or Gibralter Rock, adults displaying courtship behavior were observed at Cathedral Rock in 1997 and 1998, and young birds were seen in the Gibralter Rock area in 1996, 1997, and 1998. In addition, potentially suitable nesting habitat occurs adjacent to the project area on the cliffs associated with Oak Creek; however, no nesting activities have been observed in this area. Furthermore, these cliffs are located within developed areas of the City of Sedona, which reduces the overall quality of habitat.

Approximately 0.9 acre of Peregrine foraging (riparian) habitat will be permanently lost and 0.8 acre will be temporarily disturbed; however, this loss is not substantial when compared to the total area available for foraging Peregrines in the Sedona area. Due to the project's location relative to known or suspected nesting sites, construction activities would not result in alteration of existing nesting habitat. Although blasting could temporarily disrupt breeding Peregrines at Cathedral and Gibralter Rocks, no blasting will occur within a 1-mile radius of Cathedral Rock or Gibralter Rock during the breeding season (between March 1 and August 31). Therefore, the proposed project may impact individuals, but is not likely to result in trend toward federal listing or loss of viability.

Bald Eagle. Bald Eagles occur throughout the state during the winter, and year-round in areas along the Verde and Salt Rivers. Wintering eagles in Arizona are most often found in the White Mountains and along the Mogollon Rim, but also occur throughout the Verde Valley. Common nesting habitat includes large trees, snags, or cliffs near water with abundant fish and waterfowl for prey between

1,100 and 5,600 feet in elevation. Winters are spent along major rivers, reservoirs, highways and interstates, or in other areas where fish and/or carrion is available. Breeding and nest building can happen as early as fall, with most eggs being laid in January and February. These large nests are usually located within sight of water and mainly in living trees such as Fremont cottonwood and Goodding willow, but are occasionally found in snags. The main diet of the Bald Eagle is fish, but this species will also feed on birds and mammals. The largest threats to Bald Eagles in Arizona include loss of nesting habitat and nest failure due to flushing adults from the nest when eggs or small young are present.

The project area does contain riparian habitat associated with Oak Creek, Margs Draw, and Jacks Canyon. However, the portions of Oak Creek and Margs Draw within the project limits are located on private lands within a commercial and residential area of the City of Sedona. These areas are not considered suitable nesting habitat because of existing human disturbance. In addition, the nearest known Bald Eagle nest is located on the upper Verde River near Sycamore Creek, over 17 miles west of the project area. The home range of a nesting pair typically does not exceed 16 square miles around the nest site. The project area is located outside the home range of Bald Eagles nesting on the upper Verde River.

Although Bald Eagles are not known to nest within or near the project area, suitable foraging habitat for wintering eagles does occur within the project area, especially in the riparian areas associated with Oak Creek, Margs Draw, and Jacks Canyon. However, the minimal loss of riparian vegetation (less than 1 acre) would not affect the ability of wintering birds to forage in the area. Furthermore, all removed riparian woody vegetation 4 inches or larger in caliper will be replaced with commensurate native species. Therefore, the proposed project will not affect the Bald eagle or its habitat.

Common Blackhawk. Common Blackhawks are summer residents of Arizona and are known to nest along remote streams draining the Mogollon Rim in central Arizona, the Big Sandy River and Virgin River basin in northwestern Arizona, and the upper Gila River basin in eastern Arizona. Habitat for this species is found below the ponderosa pine and mixed-conifer zones, in the lower elevation riparian zones containing cottonwood and sycamore. This hawk is dependent upon mature, relatively undisturbed habitat supported by permanently flowing streams. Tall trees must be present along the stream course for nesting, and groves are preferred over single trees. Common Blackhawks are “still-hunters”, hunting from tree and cliff perches. In addition, they often wade into water and chase after prey on foot. Shallow streams of low to moderate gradient provide ideal hunting conditions, and food items include crayfish, amphibians, reptiles, and fish. Suitable habitat exists along Oak Creek for Common Blackhawks, but there are no known nest sites located within the project area. The proposed roadway improvements will result in minimal loss of riparian vegetation (less than 1 acre), which would not affect the ability of Common Blackhawks to forage in the area. Furthermore, all removed riparian woody vegetation 4 inches or larger in caliper will be replaced with commensurate native species. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Southwestern Willow Flycatcher. The Southwestern Willow Flycatcher occurs throughout major watersheds in Arizona during the breeding season in dense riparian vegetation associated with rivers, swamps, lakes, reservoirs, and other wetlands or saturated soil. This flycatcher occurs from near sea level to over 8,500 feet in elevation, but is primarily found in lower elevation riparian habitats. The breeding season begins in late April and lasts until September. Nest sites typically have dense foliage from the ground level up to approximately 20 feet above the ground, although dense foliage may exist

only at the shrub level, or as a low-dense canopy. Nests occur in native trees such as willow and boxelder, sometimes with a scattered overstory of cottonwood, or in non-native trees such as tamarisk or Russian olive. Nests are small, open-cupped, and constructed of leaves, grass, fibers, feathers, and animal hair. Coarser material is used in the nest base and body, and finer materials are used in the nest cup. These flycatchers are insectivores, foraging within and above the canopy, along the patch edge, in openings within the territory, and above water.

The decline of this species has been due to depletion of riparian habitat through reduction or elimination of surface and subsurface water due to diversion and groundwater pumping; changes in flood and fire regimes from dams and stream channelization; clearing and controlling vegetation; livestock grazing; changes in water and soil chemistry due to disruption of natural hydrologic cycles; and establishment of invasive non-native plants. Concurrent with habitat loss have been increases in brood parasitism by the Brown-headed Cowbird, which inhibit reproductive success and further reduce population levels.

Critical habitat is designated along Wet Beaver Creek and the Verde River, approximately 6.5 miles south, and approximately 15 miles west, respectively, of the project area. This designated critical habitat is not within the project area, and will not be directly or indirectly impacted by construction activities. In addition, no records exist for this flycatcher in the project area, and riparian vegetation within the project area does not constitute suitable habitat due to the prominence of mature cottonwood, willow, ash, and sycamore trees without dense lower-level foliage. Therefore, the proposed project will not affect the Southwestern Willow Flycatcher or its habitat.

Western Yellow-billed Cuckoo. The Yellow-billed Cuckoo was once common throughout Arizona, although numbers have declined dramatically. This species now occurs in limited numbers along the Colorado, Lower Colorado, San Pedro, Salt, Gila, and Verde Rivers, and their tributaries. Habitat of the Yellow-billed Cuckoo occurs in continuous blocks of lowland riparian areas, deciduous woodlands, as well as willow and alder thickets, second-growth woods, and deserted farmlands and orchards at lower (2,800 to 5,500 feet) to middle (5,000 to 7,500 feet) elevations. This species is found in lower elevation vegetation associations characterized by cottonwood and willow, at mid-elevations by white alder (*Alnus rhombifolia*) and bigleaf maple (*Acer macrophyllum*), and at higher elevations by willow. The Yellow-billed Cuckoo migrates to the U.S. during the warmer months to breed, and nesting occurs between middle to late May through August and frequently into September. Nests are loose twig structures built on a horizontal limb of trees, shrubs, and sometimes vines. This species feeds almost exclusively on caterpillars, and their populations fluctuate in response to caterpillar abundances, but will also feed on other insects, berries, small frogs, and lizards. The decline of the Western Yellow-billed Cuckoo has been due to the clearing of riparian woodlands, as well as the construction of upstream dams, flow alterations, and channel modifications.

The project area contains suitable habitat, and there are occurrences of the Western Yellow-billed Cuckoo in the project vicinity along Oak Creek and Dry Beaver Creek. Approximately 0.9 acre of riparian habitat will be permanently lost, most of which is private land. The area lost will be insignificant compared to the total amount of nesting and foraging habitat available along Oak Creek and Jacks Canyon. However, there is the possibility of displacing individual Yellow-billed Cuckoos associated with the clearing of riparian vegetation during construction. Considering the candidate status of this species and the length of time until construction activities will begin, it is possible that this species could be listed as a federally endangered or threatened species. If this should happen, further evaluation of this

species will be warranted, and surveys should be conducted. The proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Colorado Pikeminnow. There are no natural populations of Colorado Pikeminnow remaining within the state of Arizona, although reintroduced populations in the Verde and Salt Rivers have been established. Colorado Pikeminnow are adapted to rivers with seasonally variable flow, high silt loads, and turbulence, and can withstand a wide temperature range. They primarily are found in eddies, slackwaters, slow runs, and backwaters of these rivers, generally below 4,000 feet. This species feeds on insect larvae and zooplankton. The Colorado Pikeminnow has not been known to occur in the vicinity of the project area, although there is suitable habitat. The nearest occurrences historically and presently are in the Verde River, in which reintroduced fish were released approximately 10 miles south and downstream of the Oak Creek and Verde River confluence. Because of the measures designed to reduce environmental impacts (refer to Loach Minnow), as well as the restrictions of construction activities to aquatic habitat, no loss or degradation of habitat for the Colorado Pikeminnow will occur as a result of construction activities associated with the proposed roadway improvements. Furthermore, the effects from these activities will not be significant when compared to the typically high sediment loads occurring during average storm runoff. Therefore, the proposed project will not affect the Colorado Pikeminnow or its habitat.

Gila Chub. Historically this species was found in headwater streams of the Gila River. Presently, the Gila Chub persists only in tributaries of the San Pedro, Santa Cruz, Santa Clara, San Francisco, Gila, Verde, and Agua Fria Rivers. They are generally found in slow-moving, deep pools such as streams, marshes, springs, or cienagas containing cover such as undercut banks or broadleaf riparian and submerged aquatic vegetation that are typical of marsh habitats. Gila chub have a diet that consists primarily of insects, algae, and possibly even other fish. They are generally reproductive in the spring, depending on water flow and temperature.

The decline of the Gila Chub is mainly due to loss of aquatic habitat through arroyo cutting and subsequent dewatering, as well as being susceptible to competition for food resources and predation by introduced species.

Gila Chub do not occur in Oak Creek. The nearest occurrences are in Wet Beaver Creek, which is 6.5 miles south of the project limits and flows southwesterly into the Verde River. Wet Beaver Creek is not in the flow path of Oak Creek. The portion of Oak Creek that parallels the project area does contain suitable habitat for the Gila Chub, but because of the mitigation measures developed to reduce environmental impacts (refer to Loach Minnow), as well as the mitigations of construction activities in aquatic habitat, no loss or degradation of habitat for this species will occur as a result of construction activities associated with the proposed roadway improvements. Furthermore, the effects from these activities will not be significant when compared to the typically high sediment loads occurring during average storm runoff. Likewise, Wet Beaver Creek will not be affected by construction activities. Therefore, the proposed project will have no impact on the Gila Chub.

Loach Minnow. This species was once common throughout the Gila River basin, including the mainstem Gila River upstream of Phoenix, and the Verde, Salt, San Pedro, and San Francisco River subbasins. The Loach Minnow presently persists in limited reaches along the White River in Gila and Navajo Counties, Aravaipa and Campbell Blue Creeks, as well as the San Francisco and Blue Rivers. This species is found in small to large perennial streams with swift, shallow water over cobble and gravel, which is sometimes associated with dense, filamentous green algae. They prefer the turbulent,

rocky riffles of mainstream rivers and tributaries in plant communities consisting of open, low-growing, riparian-type vegetation composed mostly of grass and shrubs. Found at elevations less than 8,000 feet, Loach Minnows are opportunistic, benthic insectivores, preferring to feed on larvae and chironomid dipterans. The decline of this species has been due to habitat depletion from dams, water diversion, watershed deterioration, channelization, groundwater pumping, as well as competition and predation from nonnative fishes.

Although the Loach Minnow does not occur in the project vicinity, there is unoccupied designated critical habitat located downstream of the project area, approximately 800 feet west of the existing SR 179 roadway near MP 311.2. The designated critical habitat in this reach of Oak Creek is, however, considered to be degraded habitat. Construction activities that could indirectly affect the designated critical habitat include widening of the Oak Creek Bridge (approximately 2 miles upstream of the critical habitat); construction of a 245-foot retaining wall (approximately 2 miles upstream from the critical habitat); and development of a potential future scenic pullout (approximately 800 feet upstream of the critical habitat). According to the US Fish & Wildlife Service (USFWS), the area upstream of the designated critical habitat is considered unsuitable for the Loach Minnow due to existing urban and suburban development and increasing gradient and substrate size.

Because 5 acres of land or more will be disturbed, a National Pollutant Discharge Elimination System (NPDES) permit will be required, and a Storm Water Pollution Prevention Plan (SWPPP) will be prepared and implemented during construction. The widening of the existing Oak Creek Bridge will require a Nationwide Permit #13, “Bank Stabilization” for the installation of riprap bank protection, in addition to a Nationwide #33, “Temporary Construction, Access and Dewatering;” a Nationwide #14, “Linear Transportation Crossing;” and a 401 Water Quality Certification from ADEQ, because of its designation as a “Unique Water”.

To insure adequate protection of this designated Unique Water, the following mitigation measures will be implemented prior to and/or during construction. These measures reduce the potential for any indirect impacts to designated critical habitat (areas along Oak Creek) for the Loach Minnow and other aquatic-based species.

- The construction of the new bridge at Oak Creek will occur during low-flow periods, between August and December, to avoid potential impacts to the species during spawning. Any required water-diversion structure must have a spillway or culvert that will allow water to continually flow to permit fish movement up and down stream. The diversion structure will have the capability to be lowered or readily removed in case of a high-water event so that it will not be washed downstream.

- Reconstruction of the bridge will require the use of a diaper or some type of catchment mechanism under the structure to intercept inadvertent construction material dropped from the structure. Runoff from the bridge deck will not discharge directly into Oak Creek. ADEQ will monitor turbidity during construction by periodically taking measurements in Oak Creek 100 feet upstream and downstream of the construction site. According to ADEQ, turbidity downstream from the construction site in Oak Creek cannot be increased by more than three Nephelometric Turbidity Units (NTUs) during construction.

- The retaining wall adjacent to the roadway along Oak Creek will have a sediment-filter fence to contain and filter sediment during runoff periods during construction. Skimmers (oil and water

separators) will also be utilized in roadway catch basins to prevent hydrocarbons, debris, and sediment from being emptied into Oak Creek.

- ADOT District will monitor all mitigation measures encompassing sedimentation and erosion-control measures to affirm that these measures are being followed correctly and are providing the appropriate protection to sensitive areas. A Resource Protection Plan will be prepared during final design to identify sensitive areas within the project limits that will be protected from temporary construction impacts.

Because of these measures designed to reduce environmental impacts, as well as the restrictions of construction activities to protect aquatic habitat, no loss or further degradation of habitat for the Loach Minnow will occur. Furthermore, the potential indirect effects from the temporary construction activities will not diminish the value of the designated critical habitat downstream of the project area. Any increase in turbidity is anticipated to be insignificant when compared to the typical sediment loads in Oak Creek occurring during average storm runoff. Therefore, the proposed project will not affect the Loach Minnow or its habitat.

Razorback Sucker. The distribution of Razorback Suckers was widespread, inhabiting the Colorado, Gila, Salt, Verde, and San Pedro Rivers. At present day, these fish exist only in small populations with low levels of recruitment. These populations include Lake Mohave, Lake Mead, and Lake Havasu, as well as the mainstem of the Colorado and lower San Juan Rivers. Razorback Suckers can live more than 40 years, and can occupy a number of different habitats. They are generally found in the backwaters or slow-moving areas of riverine and lacustrine environments, sometimes inhabiting reservoirs, and are at elevations less than 6,000 feet. This species shows an extreme seasonal change in habitat preference, having an affinity for slower, deeper waters in the winter months, while in the summer months, inhabiting more rapid and shallower waters. Riverine Razorback Suckers spawn during the spring, depending on temperatures, and evidence suggests that these fish may even migrate to smaller tributaries to spawn. In lacustrine environments, spawning occurs from January until April or May. Food sources for these fish include algae, insect larvae, plankton, and detritus.

The decline of this species has been associated with major physical, biological, and chemical changes in riverine ecosystems. Physical changes include construction of dams, dikes, and impoundments, as well as channelization and diversioning. Biological changes include competition and predation of introduced non-native species. Lastly, the chemical changes imposed upon the environment of the Razorback Sucker may cause harm, and include contaminants such as increases in selenium concentrations within impounded areas and in irrigation return flows.

The Razorback Sucker does not occur within the project vicinity, but there is critical habitat designated along the Verde River at the confluence with Oak Creek, which is approximately 20 stream miles west and downstream of the project area. Because of the measures designed to reduce environmental impacts (refer to Loach Minnow), as well as the restrictions of construction activities to aquatic habitat, no loss or degradation of habitat for the Razorback Sucker will occur as a result of construction activities associated with the proposed roadway improvements. Furthermore, the effects from these activities will not be significant when compared to the typically high sediment loads occurring during average storm runoff, and will not appreciably diminish the value of the critical habitat. Therefore, the proposed project will not affect the Razorback Sucker or its habitat.

Roundtail Chub. The Roundtail Chub occurs throughout the Colorado River drainage system, and is widely distributed in the Gila River Basin, including the Verde River and its tributaries. This species occupies pools and eddies, often concentrating in relatively swift, swirling waters below rapids, and moving into smooth-flowing chutes in small groups, presumably to feed on drifting materials. Elevations are generally from 1,500 feet to over 6,000 feet. Cover such as boulders, tree rootwads, submerged trees and branches, and cut-banks is usually present. Food consists of aquatic and terrestrial insects, filamentous algae, and other fish. Juvenile Roundtail Chub move into quiet backwaters until they reach lengths of 25 to 50 millimeters long, in which they will feed on small insects, crustaceans, and algae films. Breeding occurs in spring and early summer, presumably in pools. This species is known to occur in Oak Creek upstream of the project area.

To prevent impacts from construction activities, a NPDES permit will be required, and a SWPPP will be implemented. In addition, because Oak Creek is a jurisdictional water of the U.S., a Section 404 Nationwide 14 Permit will be required. To minimize harm to the Roundtail Chub and its habitat, the same mitigation measures as those for the Loach Minnow will be implemented.

Because of these mitigation measures designed to reduce impacts to Oak Creek, no cumulative loss or degradation of habitat for the Roundtail Chub will occur as a result of construction activities associated with the proposed roadway improvements. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Spikedace. The Spikedace occurs in Aravaipa Creek, Eagle Creek, and the upper Verde River in Yavapai County, Arizona. The habitat of this species consists of moderate-to-large, shallow, perennial, moderate-gradient streams with sand, gravel, and/or cobble substrates, usually associated with riparian vegetation. The elevation is generally less than 6,000 feet. Although dependent on the time of year and the habitat location, this carnivorous fish generally feeds on insects and larvae of insects, or fish that are entrained within stream drift. The decline of the Spikedace is mostly due to competition with non-native species and habitat depletion such as water impoundment, stream channelization, dams, diversioning, bank stabilization, and other erosion-control efforts, as well as grazing, mining, timber harvesting, and other developmental factors.

Although the Spikedace does not occur in the project vicinity, there is unoccupied designated critical habitat located downstream of the project area, approximately 800 feet west of the existing SR 179 roadway near MP 311.2. The designated critical habitat in this reach of Oak Creek is, however, considered to be degraded habitat. Construction activities that could indirectly affect the designated critical habitat include widening of the Oak Creek Bridge (approximately 2 miles upstream of the critical habitat); construction of a 245-foot retaining wall (approximately 2 miles upstream from the critical habitat); and development of a potential future scenic pullout (approximately 800 feet upstream of the critical habitat). According to USFWS, the area upstream of the designated critical habitat is considered unsuitable for the Spikedace due to existing urban and suburban development and increasing gradient and substrate size.

Because of the mitigation measures designed to reduce impacts to Oak Creek, no loss or further degradation of habitat for the Spikedace will occur as a result of construction activities associated with the proposed roadway improvements. Furthermore, the effects from these activities will not diminish the value of the designated critical habitat, and is anticipated to be insignificant when compared to the typical sediment loads occurring during average storm runoff. Therefore, the proposed project will not affect the Spikedace or its habitat.

Tiger Beetle. Tiger Beetles occur in the Colorado River system in Coconino, Graham, Greenlee, Maricopa, Navajo, and Yuma Counties, where they are probably restricted to perennial or intermittent streams. Adults are present from April to November on sandy banks of rivers and streams, and are relatively common along the sandbanks of the Colorado River and its tributaries.

Because this beetle occurs in many counties surrounding the project area, it can be assumed that this species occurs in the project vicinity. The disturbance from reconstruction of the Oak Creek Bridge could cause displacement of individuals, as well as destruction of larval burrows, if this species was to occur in the area. However, sediment deposition, loss of riparian vegetation, and water-quality degradation will be minimal. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Maricopa Tiger Beetle. The Maricopa Tiger Beetle is found throughout Arizona, except in the hot desert habitats, but is usually found along stream drainages in the Central Highlands between 980 and 3,300 feet in elevation (although these beetles have been collected as high as 6,880 feet). Historical occurrences have been recorded along the Salt River in Phoenix, as well as Prescott, Camp Verde, and southeast Arizona. Common habitat of this species is along open sandy banks and bars of permanent or intermittent streams. Generally, they are not found along streams with dense low vegetation or where cobblestone predominates. The adults move over a wide gradient of substrate moisture, but they are seldom found on the dry banks above the stream channel or beyond. Occasionally, these beetles will be found in puddles or ponds several kilometers away from the stream, but these are most likely temporary habitats. Typical vegetation includes ash, sycamore, cottonwood, and willow, whereas the dominant vegetation outside the immediate riparian corridor varies from Juniper-Chaparral to grassland and Upper Sonoran Desertscrub.

The adult female Maricopa Tiger Beetle lays her eggs along the banks of streams, and when the larva emerge from the egg, they construct burrows and lie in wait for their arthropod prey to come near. Adult Maricopa Tiger Beetles move actively on the soil surface, preying upon living arthropods or scavenging upon dead organisms. The largest threat to this species is long-term desiccation of streams by lowering of water tables and construction of permanent dams, both leading to changes of water levels, vegetation successions, and sand deposition. Other factors include mortality from parasitoids, flooding and scouring occurring from high-water levels, and vehicles driving over sand bars.

No records exist for the Maricopa Tiger Beetle in the project vicinity. The disturbance from reconstruction of the Oak Creek Bridge could cause displacement of individuals, as well as destruction of larval burrows if this species does occur in the area. However, sediment deposition, loss of riparian vegetation, and water-quality degradation will be minimal. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Aryxna Giant Skipper. The Aryxna Giant Skipper Butterfly is found in southeastern Arizona to southwestern New Mexico, and south to Mexico, within arid but well-vegetated desert canyons or canyons with periodic water, and open grassy woodlands in the Sonoran Zone. This butterfly prefers steep cliff faces and road cuts, and is closely associated with *Agave palmeri,* into which the larvae will burrow. Other host plants include *Agave chrysantha* and *Agave deserti*. *A. chrysantha* is found between 2,300 and 7,000 feet in elevation in Yavapai County, and found on rocky slopes in high desertscrub, chaparral, and juniper grassland. This agave blooms between May and August, and hybridizes with *A. parryi* var. *couesii*, and *A. delamateri* in Yavapai County, whereas *A. deserti* is not

known to occur in Coconino or Yavapai Counties. Adults do not feed, but will sip moisture from mud or other water sources.

Because the project area is north of the range of *A. chrysantha,* this agave may not occur within the project vicinity. Likewise, there are no records of the Aryxna Giant Skipper within the project vicinity. Construction activities will result in approximately 120 acres of disturbed land that could potentially include food plants for this species, and consequently displace individual butterflies and destroy potentially suitable habitat. It is recommended that all agaves within the project area be transplanted out of harm's way of construction activities, because of the dependence this species has on this particular agave. The proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Comstock's Hairstreak. The Comstock's Hairstreak Butterfly occurs in northwest Arizona predominantly in Petran Coniferous Forest to Great Basin Conifer Woodland, and occasionally into Great Basin Desertscrub. Favored habitats include dry rocky areas of foothills and canyons of the Upper Sonoran plateaus from 5,000 to 6,000 feet. This species feeds on flower nectar, generally from species above 5,000 feet in elevation. Caterpillar host plants include various wild buckwheats, such as Wright's buckwheat and racemose buckwheat. One or two flights of this species occurs from March to May, and another in August through September, the second flight usually being the smallest.

The project area contains suitable habitat, but there are no records of Comstock's Hairstreak within the project vicinity. Construction activities will result in approximately 120 acres of disturbed land that could potentially contain caterpillar host plants for this species, and consequently displace individual butterflies and destroy suitable habitat. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Freeman's Agave Borer. Freeman's Agave Borer Butterfly is found in Mojave and Sonoran Desertscrub of central and southwestern Arizona. This butterfly is found in association with *Agave chrysantha*, which is found between 2,300 and 7,000 feet in elevation among canyons. *A. chrysantha* blooms from May to August, and can be found on open rocky slopes in high desertscrub, interior chaparral, and juniper grassland. This agave will hybridize with *A. parryi* var. *couesii* and *A. delamateri*. Freeman's Agave Borers have a single brood that are in flight from March until May. Because the project area is north of the range of *A. chrysantha,* this agave may not occur within the project vicinity. Likewise, there are no records of Freeman's Agave Borer within the project vicinity.

Construction activities will result in approximately 120 acres of disturbed land that could potentially include food plants for this species, and consequently displace individual butterflies and destroy potentially suitable habitat. It is recommended that all agaves within the project area be transplanted out of harm's way of construction activities, because of the dependence this species has on agave. The proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Neumogen's Giant Skipper. The Neumogen's Giant Skipper Butterfly ranges from central Arizona to west-central New Mexico, and occurs in upper Sonoran Life Zones or lower transition Life Zones, within open woodland or shrub-grassland that are often on mesas or mountains. There is one brood in flight from September to October. The adult butterflies of this species do not feed, but males will sip moisture from mud or manure. Larvae, on the other hand, feed on three different variations of *Agave parryi. Agave parryi* var. *couesii* is found on open slopes of grassland, chaparral, and pine-oak

woodlands in Yavapai and Coconino Counties at elevations between 3,600 and 7,000 feet. *Couesii* blooms between May and July. *Agave parryi* var. *parryi* is found in Coconino County, between 4,000 and 9,200 feet in elevation, and blooms between June and July. This variety of agave is found on open slopes of grassland, interior chaparral, and pine-oak woodlands, as well. The other variation of *Agave parryi* is not found on the Coconino National Forest.

There are occurrences of A. *parryi* within the project area. Construction activities will result in approximately 120 acres of disturbed land*;* therefore, it is recommended that all agave within the project area be transplanted out of harm's way of construction activities because of the dependence this butterfly has on this particular agave. There are no records of Neumogen's Giant Skipper within the project vicinity, but if there were, individuals will be displaced, and suitable habitat will be destroyed. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Obsolete Viceroy Butterfly. The Obsolete Viceroy Butterfly is a member of the genus *Archippus*, which occurs along major river systems discontinuously in the southwest United States, and can be found along riparian corridors from low deserts to high mountains. The habitat of the Obsolete Viceroy Butterfly includes riparian areas generally below 4,500 feet in elevation, where willows and cottonwoods persist, and is known to occur along Oak Creek and the Verde River. This subspecies apparently frequents canals, water tanks, and other areas that border humid, semi-desert bottomlands. Host plants for caterpillars include coyote willow (*Salix exigua*), Goodding willow (*Salix gooddingii*), cottonwood (*Populus fremontii*), aspen (*Populus tremuloides*), and service berry (*Prunus serotina* and *Amelanchier).* The larvae feed at night on the twigs, leaves, and other plant parts of host species in the families Salicacae, Fagaceae, and Rosaceae. Adults are in flight from May to August. The Obsolete Viceroy Butterfly has lost much of its habitat due to development, water impoundment, and the succession of saltcedar.

The project area contains suitable habitat for this butterfly, and has been known to occur within 5 miles of the project area. An individual was sighted near the Oak Creek Bridge at the northern limits of the project area. The proposed project will result in minimal loss of riparian vegetation and, likewise, limited loss of foraging habitat. However, all removed riparian woody vegetation 4 inches or larger in caliper will be replaced with commensurate native species. If individual Obsolete Viceroy Butterflies were present, they would likely be displaced. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Spotted Skipperling. The Spotted Skipperling ranges from Central New Mexico to central and eastern Arizona, and south to Mexico. These butterflies predominantly occur in Petran Coniferous Forest and Great Basin Conifer Woodlands among moist woodland openings with lush vegetation and ravines. This butterfly is in the sub-family Hesperiinae, which are the grass skippers. Grass skippers feed on the nectar of flowers as well as on grasses and sedges. The larvae live and hibernate in a nest of silk-wrapped leaves, and the pupae remain in the nest until emergence. Caterpillar hosts for the Spotted Skipperling probably occur on grasses, rushes, or sedges. One brood of this species is in flight from June until August.

There are no records of the Spotted Skipperling within the vicinity of the project, and the proposed roadway improvements will result in minimal loss of riparian vegetation, as well as limited loss of foraging habitat. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Arizona Toad. Arizona Toads have been reported from East Clear Creek and the Verde River on Blue Ridge and Beaver Creek Ranger Districts, respectively, and occur in rocky streams, canyons, and floodplains typically associated with dense riparian vegetation. This species inhabits the upland desert and pine/oak communities south of the Mogollon Rim between 2,000 and 6,000 feet in elevation. Typically, Arizona Toads occupy habitat similar to that of leopard frogs. Breeding occurs in gently flowing waters, generally with well-developed riparian vegetation, and food sources include insects and snails. Threats to the Arizona Toad include habitat destruction as well as grazing and hybridization with *Bufo woodhousii*.

There are occurrences of Arizona Toads within the project area, and suitable habitat exists along Oak Creek, but the proposed roadway improvements will result in minimal degradation of water quality, minimal loss of riparian vegetation, and, likewise, suitable habitat. Because of the dependence this species has on aquatic habitats, direct impacts to individuals will be unlikely since construction activities will be restricted to dry land, (except for the reconstruction of the Oak Creek Bridge). Furthermore, the contractor shall move any riparian reptiles or amphibians encountered during reconstruction of the bridge out of harm's way. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Arizona Night Lizard. The Arizona Night Lizard is found in central Arizona within the chaparral-oak belt. This lizard prefers hiding under trunks and leaves of dead yuccas and agaves, crevices of rocks, dead brush, and cow dung. This secretive, non-burrowing species feeds on small insects, beetles, and spider eggs.

The proposed roadway improvements could result in adverse impacts to individual lizards, but will result in minimal loss of vegetation, and will not preclude the possibility of this species inhabiting the area in the future. The contractor shall move any riparian reptiles or amphibians encountered during reconstruction of the bridge out of harm's way. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Lowland Leopard Frog. The Lowland Leopard Frog inhabits permanent stream pools, springs, stock tanks, and side channels of major rivers within desertscrub, grassland and oak, and pine/oak woodland habitats. The Lowland Leopard Frog is found from sea level to 4,800 feet in elevation, but more commonly below 3,300 feet. Seldom found in association with bullfrogs, this species is generally restricted to the permanent waters of ponds and stock tanks, springs, and side channels of streams and rivers. The Lowland Leopard Frog historically inhabited riparian habitat along Oak Creek, and has been observed during recent surveys at select sites along Oak Creek. The nearest survey site to the project area was Grasshopper Point, where tadpoles and adults were found. Grasshopper Point is located approximately 2.1 stream miles upstream of the SR 179 bridge over Oak Creek.

The proposed roadway improvements will result in minimal loss of riparian vegetation, but will not preclude the possibility of this species inhabiting the area in the future. The mitigation measures that will be implemented to control sedimentation and erosion for this project will prevent degradation of water quality for the Lowland Leopard Frog. Because of this species' dependence on aquatic habitats, direct impact on individuals will be unlikely since construction activities will be restricted to dry land, (except for the reconstruction of the Oak Creek Bridge). Furthermore, the contractor shall move any riparian reptiles or amphibians encountered during reconstruction of the Oak Creek Bridge out of harm's way. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Mexican Garter Snake. The Mexican Garter Snake is usually found in or near streams, ponds, and cienegas in the highland canyons (up to 6,200 feet in elevation) within pine/oak or pinyon/juniper woodlands, but may follow streams into lower desert grasslands. The Mexican Garter Snake is most closely linked to shallow, slow-moving, or impounded waters, though it also occurs in other aquatic environments. The diet of this species consists of leopard frogs, toads, tadpoles, and various native fishes. In addition, lizards and small rodents are food sources during occasional terrestrial forays, especially by large adults. Natural predators of Mexican Garter Snakes include some raptors, various wading birds, King Snakes, Whip Snakes, Raccoons, and Coyotes; widespread introduction of bullfrogs in Arizona have added another significant predator. Threats to the Mexican Garter Snake include habitat degradation and destruction, and predation by bullfrogs.

Mexican Garter Snakes have been sighted along the Verde River, Oak Creek, Dry Beaver Creek, and Sycamore Creek. The potential for disturbance to this species is very low because of the restricted area of construction adjacent to the creek, minimal water-quality degradation, and minimal loss of vegetation. The project could result in direct impacts to individuals of this species, but will not result in long-term effects to the Mexican Garter Snake or its habitat. The contractor shall move any riparian reptiles or amphibians encountered during reconstruction of the bridge out of harm's way. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Narrow-headed Garter Snake. The Narrow-headed Garter Snake is the most aquatic of the garter snakes, seldom found far from quiet, rocky pools. Preferred habitat is along large streams and rivers in pinyon/juniper and oak woodlands as well as ponderosa pine forests. It is primarily a species from Mexico, but is known historically from the Mogollon Rim near Flagstaff. Food items include fish, frogs, tadpoles, and salamanders.

Numerous sightings in Oak Creek have been reported. The potential for disturbance is very low because of the limited loss of riparian habitat, as well as mitigation measures for reducing erosion and sedimentation. Hence suitable habitat will be minimally disturbed. Because of the dependence this species has on aquatic habitats, direct impact on individuals will be unlikely since construction activities will be restricted to dry land (except for the reconstruction of the Oak Creek Bridge). Furthermore, the contractor shall move any riparian reptiles or amphibians encountered during reconstruction of the bridge out of harm's way. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Arizona Agave. Arizona Agave populations are located in the transition zone where the Colorado Plateau, the Mogollon Rim, the Colorado Desert, and Arizona Upland Desert converge. This species is typically found on ridges and drainages in chaparral and juniper-grassland habitats, as well as in open ranges that support cattle, at elevations between 3,000 and 6,000 feet. Soil associations are Lithic Torriorthents and Lithic Haplustolls, and may include Lithic-Haplustolls-Lithic Argiustrolls-Rock Outcrop, all of which are identified by shallow, cobbly, gravelly, sloping hills with rock outcrops. Arizona Agave is usually found with plant associations of *Agave chrysantha, A. toumeyana, Juniperus* spp.*, Quercus turbinella, Cercocarpus montanus, Echinocereus fasciculatus var. bonkerae, Yucca baccata, Nolina microcarpa, Ericameria laricifolia, Opuntia phaeacantha,* and *Rhamnus crocea*.

Soils within the project area are of the Lithic-Haplustolls-Lithic Argiustolls-Rock Outcrop, Tortugas-Purner-Jacks, and Cabezon-Thunderbird-Springerville associations. Vegetation within the area includes *Agave toumeyana, Juniperus* spp.*, Quercus turbinella, Cercocarpus montanus, Echinocereus*

spp., *Nolina microcarpa,* and *Rhamnus crocea.* There are no records of Arizona Agave in the project vicinity, and the project area is outside of the known distribution. However, potentially suitable habitat does occur within the project area. ADOT Environmental Planning Group (EPG) will conduct surveys for the Arizona Agave (*Agave arizonica*) 30 days prior to any ground-disturbing activities. If any plants are found, consultation with the USFWS will be initiated, and all plants within the disturbance area will be salvaged and transplanted to a location designated by the Forest Service. Therefore, the proposed roadway improvements will not affect the Arizona Agave or its habitat.

Kaibab Plains Cactus. The Kaibab Plains Cactus is found on the east side of the Kaibab Plateau and the west edge of House Rock Valley in Coconino County, Arizona. This species is found on south-facing slopes of fairly open, mostly level sites on alluvial fans, valley bottoms, and ridge tops, and is usually associated with blue grama grass, or sagebrush in valley bottoms. Plant communities associated with this cactus include Great Basin Grassland, Great Basin Desertscrub, Great Basin Conifer Woodland, and lower Ponderosa pine forests. Generally this species is found at elevations between 5,000 and 7,000 feet. Gravelly soils derived from Kaibab Limestone are the preferred substrate, as well as a high calcium-carbonate ratio.

Although the project area does contain potentially suitable habitat, there are no records of Kaibab Plains Cactus near the project area, and the project area is outside of this species' restricted range. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

Tonto Basin Agave. The Tonto Basin Agave is found in the foothills of the Sierra Ancha and Mazatzal Mountains, the Tonto Basin, and the Globe vicinity. This species is usually found on benches and edges of slopes overlooking drainages and gentle slopes in desert scrub, and occasionally in chaparral or juniper-grassland at elevations between 2,300 and 8,400 feet. Only 90 clones are known, and all are in association with archaeological features, suggesting prehistoric cultivation.

An informal survey was conducted on August 20, 2001, for the occurrence of Tonto Basin Agave, between the Oak Creek Bridge at MP 313.4 south within the SR 179 ROW to approximately MP 312.6. No Tonto Basin Agave were found within the project limits. In addition, Janie Agyagos, Sedona Ranger District, and Lee Leudeker, AGFD, walked the portion of the roadway that will be separated from the existing highway in June 1995 to determine habitat conditions for sensitive species.

Suitable habitat for the Tonto Basin Agave occurs within the project area. ADOT EPG will conduct surveys for the Tonto Basin Agave 30 days prior to any ground-disturbing activities. The Coconino National Forest will be notified if any Tonto Basin Agave are found, and all Tonto Basin Agave located within the disturbance area will be salvaged and transplanted to a location designated by the Coconino National Forest. Therefore, the proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability.

9. Cumulative Impacts

Future federal actions will be subject to the consultation requirements established in Section 7 of the Endangered Species Act, and therefore will not be considered cumulative to the proposed project. State and private development of the area surrounding the improvements to SR 179 is reasonably certain to continue in the future, and some of this future development will most likely result in disturbance and permanent loss of suitable habitat for several special-status species. Some of these

activities on state and private lands may require federal permits (such as Clean Water Act Section 404 permits) and thus will be subject to Section 7 consultation. In the absence of a federal nexus, activities that may result in a take of a listed species can be addressed through the section 10(a)(1)(B) permit process.

10. Determination of Effects

ESA Listed Species

The proposed project will not affect the following species or their habitats: Bald Eagle; Southwestern Willow Flycatcher; Colorado Pikeminnow; Gila Chub; Little Colorado Spinedace; Loach Minnow; Razorback Sucker; Spikedace; and Arizona Agave.

ESA Candidates and Forest Service Sensitive Species

The proposed project may impact individuals, but is not likely to result in a trend toward federal listing or loss of viability for the following species: Western Yellow-billed Cuckoo, Roundtail Chub, Kaibab Plains Cactus, Southwestern River Otter; American Peregrine Falcon; Common Blackhawk; Tiger Beetle; Maricopa Tiger Beetle; Arizona Night Lizard; Spotted Skipperling; Aryxna Giant Skipper; Comstock's Hairstreak; Freeman's Agave Borer; Neumogen's Giant Skipper; Obsolete Viceroy Butterfly; Arizona Toad; Mexican Garter Snake; Narrow-headed Garter Snake; Lowland Leopard Frog; and the Tonto Basin Agave.

11. Mitigation Measures

If blasting is required for construction, no blasting would occur between March 1 and August 31 within the 1.6-kilometer (1-mile) radius of the Peregrine Falcon Gibralter Rock or Cathedral Rock locations. The no-blast area will be identified on the resource-protection plans in final design and approved by the Coconino National Forest.

Vegetation will be preserved and protected outside of the specified construction-clearing limits. The contractor shall only remove trees when specifically authorized to do so and shall avoid damaging vegetation that is to remain in place. A resource-protection plan will be included in the construction documents to identify sensitive areas within the project limits that will need to be protected from construction impacts. Riparian areas will be identified in these plans in addition to any areas immediately adjacent to Oak Creek. All removed riparian woody vegetation (such as cottonwood, sycamore, and ash trees) 4 inches or larger in caliper will be replaced with 5-gallon container-grown plants or pole plantings of commensurate native species and shown on the landscape plans prepared for the project during final design.

The construction of the new bridge at Oak Creek will occur during low-flow periods, between August and December to avoid potential impacts to the species during spawning. Any required water-diversion structure must have a spillway or culvert that will allow water to continually flow to permit fish movement up and down stream. The diversion structure will have the capability to be lowered or readily removed in case of a high-water event so that it will not be washed downstream.

Reconstruction of the bridge will require the use of a diaper or some type of catchment mechanism under the structure to intercept inadvertent construction material dropped form the structure. Runoff

from the bridge deck will not discharge directly into Oak Creek. Turbidity will be monitored by ADEQ during construction by periodically taking measurements 100 feet upstream and downstream of the construction site.

The retaining wall adjacent to the roadway along Oak Creek will have a sediment-filter fence to contain and filter sediment during runoff periods during construction. Skimmers (oil and water separators) will also be utilized in roadway catch basins to prevent hydrocarbons, debris, and sediment from being emptied into Oak Creek.

ADOT District will monitor all mitigation measures encompassing sedimentation and erosion-control measures to affirm that these measures are being followed correctly and are providing the appropriate protection to sensitive areas.

The contractor shall move any riparian reptiles or amphibians encountered during reconstruction of the bridge out of harm's way.

ADOT EPG will conduct surveys for the Arizona Agave (*Agave arizonica*) 30 days prior to any ground-disturbing activities. If any Arizona Agave are found, consultation with the USFWS will be initiated, the Coconino National Forest will be notified, and all Arizona Agave located within the disturbance area will be salvaged and transplanted to a location designated by the Coconino National Forest.

ADOT EPG will conduct surveys for the Tonto Basin Agave (*Agave delamateri*) 30 days prior to any ground-disturbing activities. The Coconino National Forest will be notified if any Tonto Basin Agave are found, and all Tonto Basin Agave located within the disturbance area will be salvaged and transplanted to a location designated by the Coconino National Forest.

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APPENDIX

YAVAPAI AND COCONINO COUNTIES SPECIES EXCLUSION TABLE

SPECIES NAME	STATUS[1]	HABITAT REQUIREMENTS	EXCLUSION JUSTIFICATION
Arizona Bugbane (*Cimicifuga arizonica*)	CA	Mountain drainages, seeps or springs, canyon bottoms, and lower canyon slopes in deeply shaded, moist, loamy soil in transition zones between riparian and coniferous vegetation, at elevations ranging from 4,800 to 8,600 feet.	Out of elevation
Arizona Cliffrose (*Purshia subintegra*)	ESA LE	Rolling Limestone hills with sparsely vegetated ephemeral drainages within Sonoran Desertscrub between 2500 to 4,000 feet.	No suitable habitat
Brady Pincushion Cactus (*Pediocactus bradyi*)	ESA LE	Gravelly alluvium on open, sparsely vegetated benches and terraces of plateaus near Marble Canyon from 3,400 to 4,600 feet.	Out of distribution
Fickeisen Pincushion Cactus (*Pediocactus peeblesianus fickeiseniae*)	ESA C	Exposed layers of Kaibab limestone on canyon margins or hills of Navajoan desert. 4,000-5,000 feet.	No suitable habitat
Navajo Sedge (*Carex specuicola*)	ESA LT	Near seep-springs on vertical cliffs of sandstone from 5,700 to 6,000 feet.	Out of elevation
San Francisco Peaks Groundsel (*Senecio franciscanus*)	ESA LT	Volcanic talus slopes of alpine tundra in the San Francisco Peaks above 10,900 feet.	Out of elevation, no suitable habitat
Sentry Milk-Vetch (*Astragalus cremnophylax var. cremnophylax*)	ESA LE	Unshaded, open limestone with little soil in the pinyon-juniper-cliffrose plant community around the Grand Canyon between 7,000 and 7,100 feet.	No suitable habitat, out of elevation
Siler Pincushion Cactus (*Pediocactus sileri*)	ESA LT	Ecotonal between Mohave and Great Basin Deserts on gypsiferous and calcareous soils mostly derived from the Moenkopi formation from 2,800 to 5,800 feet.	No suitable habitat
Welshs Milkweed (*Asclepias welshii*)	ESA LT	Open, sparsely vegetated sand dunes of the Paria Plateau in Coconino County from 4,750 to 6,200 feet.	No suitable habitat
Kanab Ambersnail (*Oxyloma haydeni kanabensis*)	ESA LE	Wet soil with semi-aquatic plants near springs and seeps in the Grand Canyon around 2,900 feet.	Out of distribution, out of elevation
Page Springsnail (*Pyrugilopsis morrisoni*)	ESA C	Aquatic, slow or still freshwater typically at headsprings and upper section of outflows at 3,300 to 3,600 feet.	Out of elevation

Desert Pupfish (*Cyprinodon macularius*)	ESA LE	Small ponds and slower flowing streams; shallow springs; marshes; and river backwaters of the Lower Colorado River Sonoran Desertscrub. From below sea level to over 4,900 feet.	No suitable habitat
Gila Topminnow (*Poeciliopsis occidentalis occidentalis*)	ESA LE	Small streams, springs, and cienegas with dense aquatic vegetation of terrestrial riparian communities below 5,000 feet.	No suitable habitat
Humpback Chub (*Gila cypha*)	ESA LE	Large, warm, turbid rivers, especially canyon areas with deep, fast water. Below 4,000 feet.	No suitable habitat
Little Colorado Spinedace (*Lepidomeda vittata*)	ESA LT	Springs, streams and rivers with perennial flow, and are generally found in pools and riffles with water flowing over gravel and silt, between 4,000 and 8,000 feet in elevation.	Out of distribution
Chiricahua Leopard Frog (*Rana chiricahuensis*)	ESA PT	Permanent streams, springs, rivers, ponds and backwaters in Oak and mixed Oak/Pine woodlands; chaparral; grasslands; and desert between 3,300 to 8,900 feet.	Out of distribution
Brown Pelican (*Pelecanus occidentalis*)	ESA LE	Coastal lands and islands, but transient to Lower Colorado River. Elevation varies.	No suitable habitat
California Condor (*Gymnops californianus*)	ESA LE, XN	High desert canyonlands and plateaus. Elevation varies.	Out of distribution
Mexican Spotted Owl (*Strix occidentalis lucida*)	ESA LT	Steep slopes and dense, old-growth forests of mixed conifer with multi-layered foliage structure, or pine and oak woodlands between 4,100 and 9,000 feet.	No suitable habitat

[1]Status Definitions: ESA=Endangered Species Act: LE=Listed Endangered, LT=Listed Threatened, PT=Proposed Threatened. C=Candidate (USFWS has sufficient information on biological vulnerability and threats to support proposals to list as Endangered or Threatened under ESA, however, proposed rules have not yet been issued because such actions are precluded at present by other listing activities). CA=Conservation Agreement (Species receives no protection under the ESA, but is the subject of a formal conservation agreement).